

A STUDY OF THE LINEAR RELATIONSHIP BETWEEN AGE AND CANNABIDIOL (CBD) AWARENESS AND USAGE

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ABSTRACT

The Cannabidiol (CBD) industry is set to explode in sales in the next four years, and this growth has major implications for the food industry, especially for retailers and consumer goods companies. This research was performed to address the knowledge gap of whether there is a linear relationship between age and CBD awareness and willingness to try CBD. In this research, we distributed a survey that gathered demographic and behavioral responses from customers relating to awareness and willingness to try CBD. The survey was sent to a quota sampling group, in order to study a spread of age groups. Our hypothesis was individuals above 30 hold a lesser overall awareness of CBD than individuals under the age of 30. In this research, we were able to reject the null hypothesis, and therefore accept the alternative hypothesis that there is a linear relationship between age and CBD awareness and willingness to try CBD. Future replications of this study will need to strive for a stronger dispersion of ages, as well as reach a higher respondent level.

KEYWORDS: Cannabidiol, CBD, Cannabis, Food Marketing

Article History

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INTRODUCTION

The current and projected rapid growth of Cannabidiol (CBD) is leading many retailers and consumer goods companies to quickly develop production, distribution, and marketing strategies. As marketing strategies are formed, marketers need to identify current and potential CBD users, package preferences, pricing, and consumer targeting strategies. It is this environment of growth where each aspect of reaching the consumer is in need of research. In this study, we are attempting to develop a linear regression model of the relationship between age and CBD awareness and usage. From the secondary data mentioned in the literature review, we formed the hypothesis that the variables of age and CBD awareness and usage have an inverse relationship, i.e. the higher the age, the less awareness and usage.

Micro Environment

Cannabidiol (CBD) sales are projected to flourish in the next four years. According to a study by the Hemp Business Journal, consumer sales of CBD are set to equal 1.812 billion dollars by 2022, which would be a staggering 1,576% increase from the 108.1 million sales in 2014 – see figure 1 (Statista, 2019). In terms of competition, a few firms are battling for market share of the CBD industry in the United States. Many companies, such as Canopy Growth, have undertaken massive research and development campaigns in order to grab as much CBD market share as possible. According to a Pot Network article, Canopy Growth has acquired research assets from outside companies and is poised to “stay competitive on this side of the cannabis

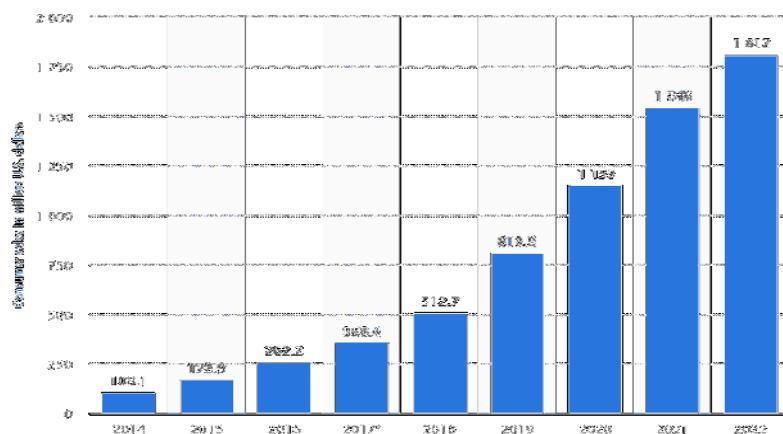


Figure 1: Projected CBD Sales (Statista, 2019).

industry” (Kuhl, 2019). Tilray, a Canadian pharmaceutical company, is making moves into the United States market as well. Their largest move to date is signing with Authentic Brand Group, who owns such subsidiaries as Nine West and Juicy Couture. Their plan is to use this agreement as an inroad to what Kuhl describes as “leverage their portfolio in order to develop, market and distribute a brand of consumer cannabis products, including CBD” (*Ibid*).

Companies competing for market share are obviously looking for returns on their investments. But as with all new or budding markets, top-of-mind awareness is also a worthy goal. Companies should want to be the first brand people think of when they think of a product category.

Macro Environment

One of the more recurring themes in the history of CBD in the United States is its legal status. The most recent legislation that affected CBD was the Farm Bill of 2018. The Farm Bill is an informal term for a body of legislation that covers broad agricultural and food policy, and it is typically amended and voted on every five years. It does not typically cover cannabis, but it was brought to the forefront of the conversation by Senate Majority Leader Mitch McConnell, who advocated strongly for hemp’s legalization. According to the Brookings Institute, McConnell’s push involved legalizing hemp, which is the portion of cannabis that “cannot contain more than 0.3% of THC” (Hudak, 2019). This move was eventually included in the final version of the bill that was ultimately signed by President Trump at the end of 2018.

Prior to this move by McConnell and the Republican Congress, CBD was almost completely illegal, as it was classified by the Controlled Substances Act as a Schedule 1 drug. According to the US Drug Enforcement Administration, Schedule 1 drugs are classified as drugs “with no currently accepted medical use and a high potential for abuse” (DEA, 2019). Schedule 2 drugs have a similar designation, but are found instead to have some potential for medical benefits. CBD seems to fit the bill for a Schedule 2 drug, but it is still lumped in with the entirety of the cannabis plant in Schedule 1. Other drugs in Schedule 2 include Fentanyl and Adderall.

LITERATURE REVIEW

Examining secondary sources available, we initially examined the summary report on CBD oil put out by the Brightfield Group. This June 2017 report aimed to establish a baseline for CBD users based off the 2400 respondents who were members of the Hello MD medicinal cannabis community. Brightfield’s report offered a well-derived summation that diagrammed uses, ingestion methods, as well as current manufacturing brands. Interestingly, this

study revealed that of its respondents 58% of CBD “only” users were women (Brightfield, 2017). While this study does offer insight, it falls short in that its chosen respondents are sourced from an online cannabis community. Due to this fact, Brightfield’s report does not offer a true representativeness of a non-biased population’s overall CBD awareness. A possible reason for a lack of awareness regarding CBD is public distrust. In an article published to Science Direct, Nancy Shute advises readers to pump the brakes regarding CBD and its purported far-reaching relief. Shute states that “the science is skimpy at best,” and that people looking into CBD use often encounter “a muddle of marketing masquerading as impartial information” (Shute, 2019).

Continuing the literature review, nearly all available sources seemed to draw a direct correlation between Cannabidiol (CBD) and Tetra Hydro Cannabinol (THC). For example, this report from the Pharmacology and Therapeutics journal has positive words for CBD while comparing it directly to THC, stating “It is undoubtedly the more interesting cannabinoid with a lot of reported pharmacological effects in several models of pathologies, ranging from inflammatory and neurodegenerative diseases, to epilepsy, autoimmune disorders like multiple sclerosis, arthritis, schizophrenia and cancer” (Pisanti, Malfitano, et al, 2017). CBD is a naturally occurring chemical that is taken from the hemp plant. CBD does not cause the “high” that THC does on its own, but it does have antipsychotic effects. It is still unknown what causes these effects in CBD. It helps to prevent the breakdown of a chemical in the brain that affects pain, mood, and mental functions. CBD is known to help manage anxiety, insomnia, and chronic pain. Still there is a need for more research to be done to find out more information about CBD (WebMD). While some studies did delineate a difference between CBD and THC, none aimed at individual substance awareness. Another common theme we found in available CBD research was tied to a specific ailment and the redeeming qualities of CBD. While this information is useful it still did not gauge an individual respondent’s overall awareness level.

The extent to which consumers are educated about CBD’s properties varies. CBD is gaining publicity from the endorsement of some professional athletes, including UFC fighters Yair Rodriguez and Nate Diaz, ultra marathon runner Avery Collins, and Tennessee Titans linebacker Derrick Morgan. All have come out and stated they use CBD to help with recovery, sore muscles, and achy joints- and also to combat general inflammation (Bible, 2019). Athletes are not the only credible sources for CBD pain relief, however. Healthcare practitioners are seemingly prescribing the product with praise, as 90% of them who prescribed the CBD explained “the technology provides more effective pain relief for their patients than over-the-counter analgesics (Abacus, 2019). Roughly 40% of U.S. adults age 21 and over indicated a willingness to explore CBD under the right conditions, according to a study by High Yield Insights. The study found the majority of those interested are 35 years or older, female, and have college experience (Specialty Food, 2019).

Other literature primarily focuses upon the physiological responses to CBD by the human body. The human Endocannabinoid System (ECS) is a self-regulating system containing receptors throughout our bodies. These receptors work together as a lock and key. When the ECS system is working properly, our bodies produce our own phytocompounds, called endocannabinoids. These compounds help the ECS in its job to communicate with each system in our body, including all our organs, the Central Nervous System, our Immune System, etc. (Hempfusion, 2018). The primary function of the ECS is to promote homeostasis, or the “self-regulating process by which biological systems tend to maintain stability while adjusting to conditions that are optimal for survival. If homeostasis is successful, life continues; if unsuccessful, illness or death ensues. The stability attained is actually a dynamic equilibrium, in which continuous change occurs yet relatively uniform conditions prevail.” (Ibid).

Other research states we did not know about our body's reaction to THC until as recently as 1988. According to CBD Origins, a team of researchers discovered a cannabinoid receptor in rats that interacted exclusively with receptors found in the cannabis compound, Tetra Hydro Cannabinol (THC). The receptors were found concentrated in parts of the brain responsible for mental and physiological processes, like memory, high cognition, emotion, and motor coordination (Cadena, 2018). When a second cannabinoid receptor was identified in rats that was distributed throughout the immune system and peripheral tissues of the body, and had the same reaction to THC as the first receptor, then a larger picture began to form. The clues led scientists to search for these receptors in other beings. They found them in humans. They called these receptors CB 1 and CB 2 (Hempfusion, 2018).

Researchers were able to further analyze the relationship between the cannabinoid receptors within our body (endocannabinoids) and the cannabinoid receptors in cannabis compounds like cannabidiol (CBD) and THC (both called phytocannabinoids). What was found was a previously unknown signaling system between phytocannabinoids and endocannabinoids. Our bodies were designed to engage with cannabinoids. These discoveries were the origin of the Endocannabinoid System (Zwanka, 2018).

The majority of the peer reviewed research has been performed on cannabinoids and their impact on the pain control of patients suffering from debilitating illnesses. According to Campbell et al, "humans have cannabinoid receptors in the central and peripheral nervous system In animal testing cannabinoids are analgesic and reduce signs of neuropathic pain. Some evidence exists that cannabinoids may be analgesic in humans (Campbell et al, 2001). In other research, it was found short-term use of existing medical cannabinoids appeared to increase the risk of non-serious adverse events. The risks associated with long-term use were poorly characterized in published clinical trials and observational studies. High-quality trials of long-term exposure are required to further characterize safety issues related to the use of medical cannabinoids (Wang et al, 2008).

Researchers have been investigating the anti-cancer properties held within CBD, along with other medical related issues. Research is currently being conducted on the benefits of CBD, where potential claims to treating a wide range of problems like "arthritis, diabetes, alcoholism, MS, chronic pain, PTSD, depression, antibiotic- resistant infections are being found" (CBD User Manual, n. d.). Although CBD does not get you high, it shares common characteristics with marijuana, such as smell and appearance. Because of these similarities, negative stigmas are held against the cannabis plant, in general. Many people believe that because CBD is derived from the same plant as marijuana, it must also contain the negative aspects that marijuana contains. However, many people fail to realize that CBD is actually derived from hemp, which has little to no THC content included (Cadena, 2018).

It must be understood that individuals compare the perceptions of those around them when considering trying out a new product. People build reference points based on heuristics. A common heuristic when purchasing new products is to examine what your friends and family purchase and what they think of the product. For a consumer with no prior knowledge of what CBD is, they may heavily rely on what those close to them believe about the product. This can be considered both a threat and an opportunity. If many still hold the negative stigmas as their reference point and perception, this is likely to affect other individual purchasing habits. However, if those around them believe CBD is a wonderful product and recommend it to others, this could positively influence others purchasing decisions. Research and evidence has the chance to influence the perception of individuals, thus affecting how those around them view CBD (Taylor, 2018).

Utilizing these studies as bookends we can begin to frame a need for primary research. As outlined above, there are ample studies highlighting CBD and its associated attributes, yet there is a lack of understanding to determine overall awareness. By understanding overall market awareness of CBD based upon demographics, researchers than can better gauge future CBD studies.

RESEARCH NEED

As CBD moves further into the consumer's consciousness, we feel that the timing is right to do research in a time where we believe CBD is on the cusp of becoming an everyday, if not more common treatment, for a variety of ailments. Research on it is thin, which can lead to hyperbole and misreading of what little we have in an effort to reach a final public verdict. With this in mind, we do not intend our research to be the end-all answer to who is most aware of CBD. We understand that this same survey could yield dramatically different results in another 5 to 10 years. Our objective is to provide a good measure of where the minds of consumers are situated at this moment – in a moment where the public is coming into its own regarding CBD awareness in hopes of providing some guidance to marketers in regards to consumer demographic targeting. The primary contribution to the body of knowledge from this research, or the research gap to be filled, is centered upon age and its relationship to CBD awareness and usage.

RESEARCH OBJECTIVES

In order to find the relationship between age and CBD awareness, we will be comparing two variables. The first one is the age of the respondents, and the second one will come from one of our selected questions regarding awareness. Our hypotheses are as follows:

- **Null Hypothesis (H_0):** Individuals over the age of 30 are just as aware and possess similar knowledge of CBD as individuals under 30.
- **Alternative Hypothesis (H_1):** Individuals over the age of 30 are less aware and possess lesser knowledge of CBD than individuals under 30.

In this set of hypotheses, the constructs present are the varying levels of awareness a consumer may have regarding CBD that are represented in the survey questions.

Design of Survey

In order to obtain our data, a survey was distributed to a student population, as well as friends and families of the researchers. The survey began to be released in early March, and responses were formally closed on April 9th, 2019.

Data Collection

For our research the main demographic we had to prioritize in differentiating was age. Our hypothesis will compare those that are younger than 30 with those that are older than 30. We strived to reach individuals of varying ages by contacting younger adults across campus via commonly used social media platforms native to our age group, such as Snapchat and Instagram. We contacted older individuals through company-wide email listings available to parents and older acquaintances. By definition, we were attempting a quota sampling by age, in order to ascertain some degree of representativeness of each age group.

DATA ANALYSIS

We tested our set of hypotheses by running our data through a series of regressions. The regression analysis allows us to examine the influence of multiple independent variables over a single dependent variable. For this study, our dependent variable was the age of the respondent, primarily focusing on “under 30” and “over 30”. Our independent variables were all of the other questions we asked throughout the survey. Some of the questions were “yes or no” questions, while others were more in-depth, prompting the respondent to gauge how strongly they agree or disagree with the statement. figures 2 and 3 show an example of the raw data, and the tagging of the data for analysis.

Does Age Impact CBD Acceptance?													
Respondent	Age	Gender	Awareness Prior to Survey	Medium of Awareness	Knows someone that tried CBD	Personally Used CBD	Usage Reason	Awareness of Difference between CBD & THC	Possession of knowledge for CBD	Considers CBD alongside common drugs	CBD Future Medicinal Usage	Would take CBD in the Future	
1	18-22	male	yes	print media	no	no		no	neither agree nor disagree	neither agree nor disagree	neither agree nor disagree	neither agree nor disagree	
2	18-22	female	no		yes	no		yes	neither agree nor disagree	somewhat disagree	somewhat agree	somewhat disagree	
3	18-22	male	yes	digital media	yes	yes	stress/anxiety relief	yes	somewhat agree	strongly disagree	strongly agree	somewhat agree	
4	18-22	male	no		no	no		no	strongly disagree	neither agree nor disagree	neither agree nor disagree	somewhat agree	
5	18-22	female	yes	digital media	yes	yes	stress/anxiety relief	yes	somewhat agree	strongly agree	strongly agree	strongly agree	
6	18-22	male	no		no	no		no	strongly disagree	strongly agree	somewhat agree	strongly agree	
7	18-22	male	yes	digital media	yes	yes	stress/anxiety relief	yes	somewhat agree	neither agree nor disagree	somewhat agree	somewhat agree	
8	18-22	male	yes	other media	yes	yes		yes	somewhat agree	neither agree nor disagree	somewhat agree	somewhat disagree	
9	18-22	male	yes	digital media	yes	yes	other	yes	neither agree nor disagree	somewhat agree	strongly agree	strongly agree	
10	18-22	female	yes	other media	yes	no		yes	somewhat agree	somewhat agree	strongly agree	strongly agree	
11	18-22	female	yes										
12	18-22	female	yes	other media	yes	yes	stress/anxiety relief	yes	strongly agree	somewhat agree	strongly agree	strongly agree	
13	18-22	male	yes	digital media	yes	yes		yes	strongly agree	strongly agree	strongly agree	somewhat agree	
14	18-22	male	yes	other media	yes	no		yes	strongly agree	somewhat agree	somewhat agree	somewhat agree	
15	18-22	female	yes										
16	18-22	female	yes	other media	no	no		yes	somewhat disagree	neither agree nor disagree	neither agree nor disagree	somewhat agree	
17	18-22	male	yes	digital media	yes	yes	stress/anxiety relief	yes	somewhat agree	somewhat agree	strongly agree	neither agree nor disagree	
18	18-22	male	yes	print media	yes	yes	stress/anxiety relief	yes	somewhat agree	somewhat disagree	strongly agree	somewhat agree	
19	18-22	male	yes	digital media	yes	yes	stress/anxiety relief	no	somewhat disagree	strongly disagree	somewhat agree	somewhat agree	
20	18-22	male	yes	digital media	yes	no		yes	somewhat agree	somewhat agree	somewhat agree	somewhat disagree	
21	18-22	male	yes	other media	yes	yes	stress/anxiety relief	yes	strongly agree	somewhat agree	strongly agree	strongly agree	
22	18-22	male	yes	other media	yes	yes	stress/anxiety relief	yes	somewhat agree	neither agree nor disagree	strongly agree	strongly agree	
23	18-22	female	yes	digital media	yes	no		yes	strongly agree	somewhat agree	strongly agree	strongly agree	
24	18-22	male	yes	print media	yes	yes	stress/anxiety relief	yes	strongly agree	somewhat agree	strongly agree	strongly agree	
25	18-22	female	yes	digital media	yes	yes	stress/anxiety relief	yes	somewhat agree	neither agree nor disagree	somewhat agree	somewhat agree	
26	18-22	female	yes										
27	18-22	male	yes	other media	yes	yes	stress/anxiety relief	yes	strongly agree	neither agree nor disagree	strongly agree	somewhat agree	
28	18-22	female	yes	digital media	yes	yes	stress/anxiety relief	yes	strongly agree	somewhat agree	strongly agree	strongly agree	
29	18-22	male	no		no	no		no	strongly disagree	neither agree nor disagree	neither agree nor disagree	neither agree nor disagree	

Figure 2: Raw Data File.

Does Age Impact CBD Acceptance?													
Respondent	Age	Gender (Blue=Boy Red=Girl)	Awareness Prior to Survey	Medium of Awareness	Knows someone that tried CBD	Personally Used CBD	Usage Reason	Awareness of Difference between CBD & THC	Possession of knowledge for CBD	Considers CBD alongside common drugs	CBD Future Medicinal Usage	Would take CBD in the Future	
1	1	1	1	2	2	2	0	2	3	3	3	3	
2	1	2	2	0	1	2	0	1	3	2	4	2	
3	1	1	1	1	1	1	1	1	4	2	5	4	
4	1	1	2	0	2	2	0	2	1	3	3	4	
5	1	2	1	1	1	1	1	1	4	5	5	5	
6	1	1	2	0	2	2	0	2	1	5	4	5	
7	1	1	1	1	1	1	1	1	4	3	4	4	
8	1	1	1	3	1	2	0	1	4	3	4	2	
9	1	1	1	1	1	1	3	1	3	4	5	5	
10	1	2	1	3	1	2	0	1	4	4	5	5	
11	1	2	1	0	0	0	0	0	0	0	0	0	
12	1	2	1	3	1	1	1	1	5	4	5	5	
13	1	1	1	1	1	2	0	1	5	5	5	4	
14	1	1	1	3	1	2	0	1	5	4	4	4	
15	1	2	1	0	0	0	0	0	0	0	0	0	
16	1	2	1	3	2	2	0	1	2	3	3	4	
17	1	1	1	1	1	1	1	1	4	4	5	3	
18	1	1	1	2	1	1	1	1	4	2	5	4	
19	1	1	1	1	1	1	1	2	2	1	4	4	
20	1	1	1	1	1	2	0	1	4	4	4	2	
21	1	1	1	3	1	1	1	1	5	4	5	5	
22	1	1	1	3	1	1	1	1	4	3	5	0	
23	1	2	1	1	1	2	0	1	5	4	5	5	
24	1	1	1	2	1	1	1	0	0	0	0	0	
25	1	2	1	1	1	1	1	1	4	3	4	4	
26	1	2	1	0	0	0	0	0	0	0	0	0	
27	1	1	1	3	1	1	1	1	5	3	5	4	
28	1	2	1	1	1	1	1	1	5	4	5	5	
29	1	1	2	0	2	2	0	2	1	1	3	3	

Figure 3: Tagged Data for Analysis.

When interpreting a regression analysis, there are a few numbers that we have to pay close attention to, those being the R-Square value and the P-Value of each independent variable. The R-Square will help us determine how accurate the independent variables are to predicting the value of the dependent variable. In other words, how accurately a survey's answers can predict the age bracket of a respondent. The closer the R-Square value is to 1, the more accurately the independent variables predict the age bracket. The P-Value of each dependent variable determines which hypothesis we accept and which one we reject. Given that we are working with significance level of .05, we will only accept the alternative hypothesis if the P-Value is less than the significance level.

Our first regression was run with all 11 variables versus our dependent variable (figure 4). This regression analysis reported an R-Square of .34 and 3 dependent variables' P-values were less than the significance level, thus accepting the alternative hypothesis. However, upon closer examination of the data, a few of these variables can be eliminated from determining which factors impact age. For instance, our data compares those that are less than 30 and those that are older than 30. When conducting our survey, 57% of individuals that are less than 30 were female, while a staggering 89% of people that are older than 30 were also female. With this skewing, it would be inaccurate to include gender in the regression analysis based upon the chance bias of women over 30 years of age that participated in the survey.

Looking graphically at a trend line of awareness, run against age, the relationship becomes apparent- see figure 5.

In figure 6, we tabulated the responses by percentages, in order to show a consistent trend towards those under 30 and their stronger awareness of CBD, as well as a willingness to try CBD. We can interpret a weak to moderate association of these variables, which will need further isolation in future studies to determine if a high correlation or linear relationship exists.

SUMMARY OUTPUT				
Regression Statistics				
Multiple R				0.587070431
R Square				0.344651691
Adjusted R Square				0.26179156
Standard Error				1.594828781
Observations				99
ANOVA				
	df	SS	MS	F
Regression	11	116.3739064	10.57945	4.159439
Residual	87	221.2826593	2.543479	
Total	98	337.6565657		
	Coefficients	Standard Error	t Stat	P-value
Intercept	-0.179000928	1.164631002	-0.1537	0.878204
Gender (Blue=Boy) (Red=Girl)	1.264942154	0.338456067	3.73739	0.000332
Awareness Prior to Survey	-0.958479111	0.586643905	-1.63383	0.105907
Medium of Awareness	0.027349422	0.214549963	0.127473	0.89886
Knows someone that tried CBD	1.338924131	0.471154452	2.841794	0.005588
Personally Used CDB	0.918072187	0.497254658	1.846282	0.068252
Usage Reason	0.748453407	0.287940712	2.599332	0.010971
Awareness of Difference between CBD & THC	0.0976549	0.460675976	0.211982	0.832617
Possession of knowledge for CBD	-0.229971386	0.163351623	-1.40783	0.162744
Considers CBD alongside common drugs	-0.145450146	0.152371133	-0.95458	0.342436
CBD Future Medicinal Usage	0.019395459	0.174881826	0.110906	0.911946

Figure 4: First Regression with all Variables.

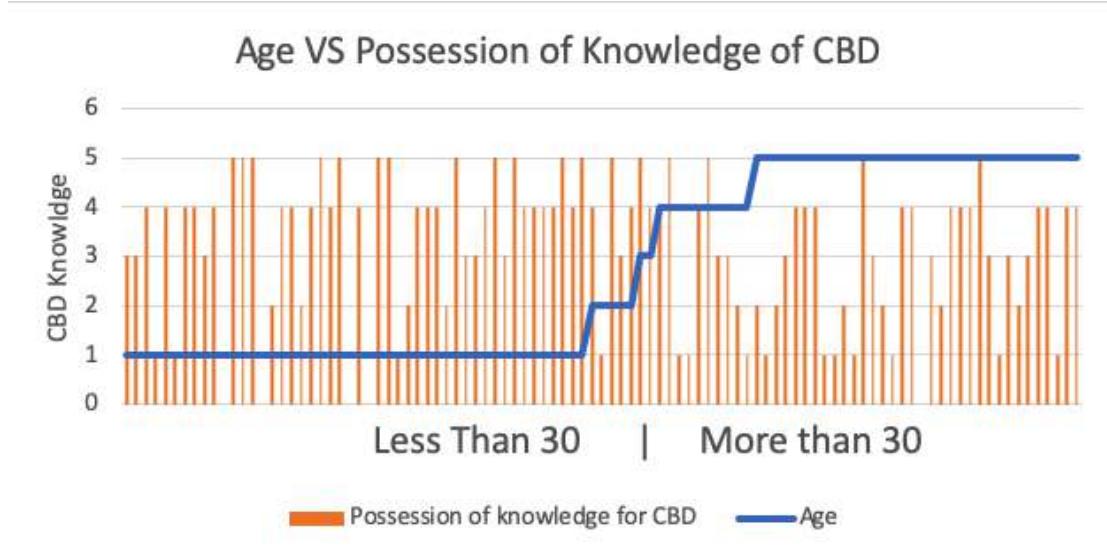


Figure 5: Trend Regression Line for Age.

	Possession of knowledge for CBD	No Possession of knowledge for CBD	Considers CBD alongside common drugs	Doesn't Consider CBD alongside common drugs	Pro CBD Future Medicinal Usage	Anti CBD Future Medicinal Usage	Would take CBD in the Future	Wouldn't take CBD in the Future
Respondents less than 30 years old	62.26%	15.09%	37.74%	33.96%	73.58%	5.66%	56.60%	13.21%
Respondents older than 40 years old	40.91%	38.64%	20.45%	50.00%	63.64%	9.09%	29.55%	20.45%

	Awareness Prior to Survey	Unawareness Prior to Survey	Knows someone that tried CBD	Doesn't know someone that tried CBD	Personally Used CDB	Hasn't personally Used CDB	Awareness of Difference between CBD & THC	Unawareness of Difference between CBD & THC
Respondents less than 30 years old	79.25%	20.75%	73.58%	20.75%	35.85%	58.49%	71.70%	20.75%
Respondents older than 40 years old	70.45%	27.27%	50.00%	50.00%	22.73%	75.00%	54.55%	43.18%

Figure 6: Responses in % Form.

When running the regression of Age vs Possession of knowledge for CBD, we found that our independent variable was reporting a P-value of .044, which is lower than our significance level of .05. This means that we can statistically accept the alternative hypothesis that individuals over the age of 30 are less aware and possess lesser knowledge of CBD than individuals under 30.

Implications, Limitations and Replication Information

The implications of this data are primarily focused upon how marketers and retailers seek to reach potential and current CBD users. Understanding how age is impacting CBD awareness and usage can then be integrated into the marketing strategies, in order to target younger consumers with availability and older consumers with knowledge and an awareness campaign.

Obtaining this data had a number of limitations that would need to be controlled during replication. Despite receiving approximately 130 responses to our survey, we were only allowed to view and interpret 100 observations, due to incomplete responses. Also, the age breakout, although evenly distributed at the two tails, has a low response rate in the middle range of ages:

48.48% were 18–22

5.05% were 23–29

2.02% were 30–40

10.10% were 40–50

34.34% were 50+

This smaller sample limits the accuracy of our data. If we were to repeat this research study, we would aim to acquire a larger sample size so that the data can more accurately conclude our hypotheses.

REFERENCES

1. Abacus Health Products. "CBDMEDIC Launches Topical Pain Relief Medications." PR Newswire: Press Release Distribution, Targeting, Monitoring and Marketing, 27 Mar. 2019, www.prnewswire.com/news-releases/cbdmedic-launches-topical-pain-relief-medications-300819477.html.
2. Bible, A. (2019, March). WHAT'S THE DEAL WITH CBD? This plant compound found in marijuana may be able to help drive gains by wiping out pain and boosting recovery. *Joe Weider's Muscle & Fitness*, 80(3), 124+. Retrieved from, http://link.galegroup.com.ezproxy.siena.edu:2048/apps/doc/A578157276/HRCA?u=nysl_ca_siena&sid=HRCA&xid=da2f0219.
3. Brightfield Group (2017 June). Summary Report; Understanding Cannabidiol. In Statista – The Statistics Portal. Retrieved April 20, 2019, from <https://www-statista-com.ezproxy.siena.edu/study/50238/cannabidiol-survey-on-users-and-market-2017/>.
4. Cadena, Aaron. "5 Ways CBD Is Smashing People's Perspectives of Cannabis." Medium.com, Medium, 23 May 2018, www.cbdorigin//medium.com/cbd-origin/5-ways-cbd-is-smashing-peoples-perspectives-of-cannabis-8fd733b19dc9.
5. Cadena, Aaron. "Hemp vs Marijuana: The Difference Explained." CBD Origin, CBD Origin, 21 Nov. 2018, www.cbdorigin.com/hemp-vs-marijuana.
6. Campbell, Fiona A; Tramèr, Martin R; Carroll, Dawn; Reynolds, John; Moore, Andrew; Mc Quay, Henry. Are cannabinoids an effective and safe treatment option in the management of pain? A qualitative systematic review. *BMJ* 2001; 323: 13.
7. "CBD User Manual." Project CBD: Medical Marijuana & Cannabinoid Science, www.projectcbd.org/guidance/cbd-users-manual.
8. DEA.gov. (n.d.). Drug Scheduling. Retrieved from <https://www.dea.gov/drug-scheduling>.
9. Hello MD. "Understanding Cannabidiol CBD Industry report – Hello MD – Brightfield group". <https://www.hellomd.com>.
10. Hempfusion.com. (2018). <https://hempfusion.com/executive-team/>.

11. Hudak, J. (2018, December 13). *The Farm Bill, hemp legalization and the status of CBD: An explainer.* Retrieved April 19, 2019, from <https://www.brookings.edu/blog/fixgov/2018/12/14/the-farm-bill-hemp-and-cbd-explainer/>.
12. Kuhl, L. (2019, January 24). *Take a look at three companies best positioned to take on the \$22 billion CBD industry.* Retrieved April 18, 2019, from <https://www.potnetwork.com/news/take-look-three-companies-best-positioned-take-22-billion-cbd-industry>.
13. Pisanti, S, Malfitano, A, Lamberti, et al.: *State of the art and new challenges for therapeutic applications.* *Pharmacology & Therapeutics* OL February 2017 Pg. 133-150. Retrieved April 20, 2019 from Science Direct. 1. <https://www.sciencedirect.com/science/article/pii/S0163725817300657?via%3Dihub>.
14. Shute, Nancy. "The Science of CBD Lags behind Its Marketing." *Science News*, Vol. 195, No. 6, Mar. 2019, p. 2. <https://www.sciencenews.org/article/science-cbd-lags-behind-its-marketing>.
15. Taylor, J. (2018, October 15). *What is CBD? Here's what to know about Cannabidiol.* <https://www.menshealth.com/health/a22126593/what-is-cbd-oil>.
16. Wang, Tongtong; Collet, Jean-Paul; Shapiro, Stan; Ware, Mark. *Adverse effects of medical cannabinoids: a systematic review.* *CMAJ Jun 2008, 178 (13) 1669–1678; DOI: 10.1503/cmaj.071178.*
17. WebMD. "Cannabidiol: Uses, Side Effects, Interactions, Dosage, and Warning." *WebMD*, *WebMD*, www.webmd.com/vitamins/ai/ingredientmono-1439/cannabidiol.
18. Westword. (n. d.). *Total U.S. cannabidiol (CBD) consumer sales from 2014 to 2022 (in million U.S. dollars).* In Statista - The Statistics Portal. Retrieved April 19, 2019, from <https://www-statista-com.ezproxy.siena.edu/statistics/760498/total-us-cbd-sales/>.
19. Zwanka, Russell. (2018). *CBD Dreams: A Retailer's Case for CBD Sales.* KDP Publishing.
20. Hillig, K. W., & Mahlberg, P. G. (2004). *A chemotaxonomic analysis of cannabinoid variation in Cannabis (Cannabaceae).* *American journal of botany*, 91(6), 966–975.

AUTHOR PROFILE



Dr. Russell J. Zwanka is a Professor at Siena College, in Albany, New York. Dr. Z teaches Marketing Research, Food Marketing, Category Management, and Marketing Principles. Having spent a career in the food industry before teaching, Dr. Z conceptualized and formed the Food Marketing Concentration at Siena College, and the program and curriculum for the Food Marketing Track at the State University of New York at New Paltz.

Zwanka has written 18 books, on topics ranging from Category Management Principles to public speaking to walking a retail store (A Store Walk) to Cannabidiol (CBD). Zwanka has been peer-reviewed published on topics ranging

from craft beer trends, local social consciousness and ethics in the food industry, supermarket choice amongst college students, and everyday low pricing in store brands.

As Chair of the Food Industry University Coalition, Zwanka works with other Food Marketing/ Supply Chain universities across the United States, with the focus on food industry student education and thought leadership. Zwanka is a Regent with the National Grocers Association (NGA) Foundation, and is a frequent speaker at food industry events, including the Promotional Optimization Institute.

Zwanka holds a Doctorate in International Business from ISM in Paris, France. He also holds a Masters of Science in Management from Southern Wesleyan University, and a Bachelors of Science in Psychology from the University of South Carolina. Dr. Z can be followed at “rzwanka” on Twitter and Instagram, and www.tripleeightmarketing.com.

